

Claims

1. Tubular piston (1) for a piston engine, in particular an axial piston engine, which piston has a peripheral wall (3a), a central pin (11), an end wall (3b) at its front end and a joint part (4a) at its rear end, wherein said tubular piston (1) has, between the peripheral wall (3a) and the joint part (4a), an annular formed-in portion (14) which is formed against the pin (11), and wherein a rear section of the formed-in portion (14) constitutes a front section of the joint part (4a), characterised in that the pin (11) terminates in the region of the formed-in portion (14), that the joint part (4a) has a dome-shaped joint recess (4c), and that the rear section of the formed-in portion (14) constitutes at least part of a joint surface (4g) belonging to the joint recess (4c).
2. Tubular piston according to Claim 1, characterised in that the pin (11) likewise constitutes, at its rear end, part of the joint surface (4g) of the joint recess (4c).
3. Tubular piston according to Claim 1 or 2, characterised in that the peripheral wall (3a) and/or the pin (11) is/are constructed in one piece with the end wall (3b).
4. Tubular piston according to Claim 3, characterised in that the end wall (3b) and the peripheral wall (3a) and/or the pin (11) are formed onto one another in a non-cutting manner.

5. Tubular piston according to one of the preceding claims,
characterised in that
the pin (11) has a duct (12) passing through it
axially.
6. Tubular piston according to Claim 5,
characterised in that
the duct (12) has a throttle (12a) which is preferably
10 disposed in the region of the formed-in portion (14).
7. Tubular piston according to one of the preceding claims,
characterised in that
15 the formed-in portion (14) is pressed into the
superficies (11a) of the pin (11).
8. Tubular piston according to one of the preceding claims,
20 characterised in that
the junction between the formed-in portion (14) and
the pin (11) is sealed, in particular by a welding
seam (21) or a soldering seam (22) or a ring seal
(19).
- 25 9. Method of manufacturing a tubular piston (1) having a
peripheral wall (3a), a central pin (11), an end wall
(3b) at its front end and a joint part (4a) at its
rear end, in which an annular formed-in portion (14)
30 of the peripheral wall (3a) is formed against the
superficies (11a) of the pin (11),
characterised in that
the joint part (4a) is formed as a dome-shaped joint
recess (4c),
35 that the pin (11) is constructed with a length such
that it terminates in the region of the formed-in
portion (14), and

that the formed-in portion (14) is formed in such a way that its rear section constitutes at least part of a joint surface (4g) belonging to the joint recess (4c).

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10. Method according to Claim 9,
characterised in that
the peripheral wall (3a) is prefabricated with a thickened portion of material (3d) in the region of the formed-in portion (14) and is formed-in, with the thickened portion of material (3d), in such a way that its outer peripheral surface is substantially in alignment with the rest of the outer peripheral surface (3d) of the peripheral wall (3a).

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11. Tubular piston for a piston engine, in particular an axial piston engine, which piston has a peripheral wall (3a) and a central pin (11), which peripheral wall is constituted by a formed-in portion (14) of said peripheral wall (3a) which is directed against the superficies (11a) of said pin (11),
characterised in that
the formed-in portion (14) is in alignment, at its outer periphery, with the rest of the region of the superficies (3a) of the piston (1).

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12. Tubular piston according to Claim 11,
characterised in that
the formed-in portion (14) contains a thickened portion of material (3d) which is prefabricated in a manner protruding radially from the peripheral wall (3a).

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13. Tubular piston according to Claim 12,
characterised in that

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the lateral surfaces (3f) of the thickened portion of material (3d) extend in an outwardly convergent manner.

5 14. Method of manufacturing a tubular piston (1) for a piston engine, in particular an axial piston engine, said piston having a peripheral wall (3a), a central pin (11) and a joint part (4a) at its rear end, in which piston a formed-in portion (14) is formed-in, in
10 the peripheral wall (3a) of an end wall (3b) at the front end of said piston, against the superficies (11a) of the pin (11),
characterised in that
the peripheral wall (3a) is prefabricated with a
15 thickened portion of material (3d) in the region of the formed-in portion (14), and is formed-in, with the thickened portion of material (3d), in such a way that its outer peripheral surface is substantially in alignment with the rest of the outer peripheral
20 surface (3d) of the peripheral wall (3a).

15. Method according to Claim 10 or 14,
characterised in that
the thickened portion of material (3d) is
25 prefabricated with convergent lateral surfaces (3f).

16. Method according to Claim 9,
characterised in that
the peripheral wall (3a) is prefabricated with a
30 cross-sectional oversize (x) and the formed-in portion (14) is formed-in to an extent such that its outer peripheral surface corresponds to said oversize (x).

35 17. Method according to Claim 9 or 16,
characterised in that the pin (11) is constructed with a length such that it forms, at the rear end, part of the joint surface (4g) of the joint recess (4c).

18. Method according to one of Claims 9, 16 or 17,
characterised in that
the formed-in portion (14) is pressed into the
superficies (11a) of the pin (11).

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19. Method according to one of Claims 9 or 16 to 18,
characterised in that
the peripheral wall (3a) is prefabricated with a
thickened portion of material (3d) in the region of
the formed-in portion (14), and is formed-in, with the
thickened portion of material (3d), in such a way that
its outer peripheral surface is substantially in
alignment with the rest of the outer peripheral
surface (3d) of the peripheral wall (3a).

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20. Tubular piston (1) which is closed at its front end by
an end wall (3b) and has a joint part (4a) at its rear
end,
characterised in that
the cavity (9) is open towards the outside through a
duct (21) whose aperture (22) is disposed in the rear
end region of the tubular piston (1).

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21. Tubular piston according to Claim 19,
characterised in that
the duct (21) opens onto the outer superficies (3g) of
the tubular piston (1).

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22. Tubular piston according to Claim 20,
characterised in that
the duct (21) extends rearwards and, at the same time,
obliquely towards the outside.

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23. Tubular piston according to one of Claims 20 to 22,
characterised in that

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two or more ducts (21) are provided, which are disposed in a manner distributed over the periphery.